

CONTENTS

PART II

SSI-9 Organizing Committee	vii
Preface	ix

FUNDAMENTAL STUDIES I, IONIC AND ELECTRONIC MOTION

I. Riess, R. Safadi and H.L. Tuller, Problems with Hebb-Wagner polarization measurements due to overpotentials and decomposition of the sample	3
J. ten Eicken, W. Gunsser, M. Karus, A. Meyer and I.V. Murin, On the structure and dynamics of heterovalently doped β -PbF ₂	7
A. Bernasik, M. Rekas, M. Sloma and W. Weppner, Electrical surface versus bulk properties of Fe-doped TiO ₂ single crystals	12
H. Sato and A. Datta, Frequency dependence of ionic conductivity in lattice gas models	19
S. Rüße, M.M. Lohrengel and J.W. Schultze, Ion migration and dielectric effects in aluminum oxide films	29
A. Orliukas, P. Bohac, K. Sasaki and L.J. Gauckler, The relaxation dispersion of the ionic conductivity in cubic zirconias	35

FUNDAMENTAL STUDIES II, DEFECT STUDIES

T. Bieger, H. Yugami, N. Nicoloso, J. Maier and R. Waser, Optical absorption relaxation applied to SrTiO ₃ and ZrO ₂ : An in-situ method to study trapping effects on chemical diffusion	41
F.W. Poulsen, G. Lauvstad and R. Tunold, Conductivity and Seebeck measurements on strontium ferrates	47
M.S. Islam and D.J. Ilett, Defect structure and oxygen migration in the La ₂ O ₃ catalyst	54
S. Kramer, M. Spears and H.L. Tuller, Conduction in titanate pyrochlores: role of dopants	59
M. Martin and R. Schmackpfeffer, Demixing of doped oxides: influence of defect interactions	67
A. Hoser, M. Martin, W. Schweika, A.E. Carlsson, R. Caudron and N. Pyka, Diffuse neutron scattering of iron-doped nickel oxide	72

FUNDAMENTAL STUDIES III AND IV

K. Koto, K. Suda, N. Ishizawa and H. Maeda, Oxide ion motion in bismuth sesquioxide (δ -Bi ₂ O ₃)	79
H.J. Schütt, A new phenomenological description of the electrical relaxation in ionic conductors	86
M. Sloma, W. Weppner and M. Rekas, Thermoelectric power of tetragonal ZrO ₂	89
T. Sakuma, F. Suzuki and S. Hoshino, Diffuse scattering of β -Ag ₃ Si by neutron powder diffraction	94

Contents

POLYMER ELECTROLYTES

R. Frech and W. Huang, Polymer conformation and ionic association in complexes of lithium, sodium and potassium triflate with poly(ethylene oxide) oligomers	103
S. Skaarup, K. West, B. Zachau-Christiansen, M.A. Careem and G.K.R. Senadeera, Electrolyte and ion memory effects in highly conjugated polypyrrole	108
C. Arbizzani, M. Borghini, M. Mastragostino, L. Meneghelli and A. Zanelli, Impedance spectroscopy in electrode/electrolyte interface investigations	115
D. Teeters and C.M. Hill, Comparative study of the mixed-alkali effect in poly(ethylene oxide) and poly(propylene oxide)-thiocyanate salt systems	122
M.D. Glasse, R.J. Latham, R.G. Linford, W.S. Schlindwein and M.A. Careem, Polymer electrolyte kinetics as a function of formation temperature	127
P. Ferloni, P. Mustarelli, A.K. Saraswat, G. Chiodelli and A. Magistris, Thermal and transport properties in the polymer electrolyte system $P(EO)_n\text{--Pb(ClO}_4)_2$	135
M. Andrei, L. Marchese, A. Roggero and P. Prosperi, Polymer electrolytes based on crosslinked silylated poly-vinyl-ether and lithium perchlorate	140
A.V. Chadwick, P. Hanmer, L. Coppola, G. Ranieri and M. Terenzi, Ionic environment and transport in polymer electrolytes	147
D. Prusinowska, W. Wieczorek, H. Wyciślik, M. Siekierski, J. Przyłuski and J. Soltysiak, Conductivity and structural studies of PEO-NH ₄ SCN electrolytes	152
C. Roux and J.-Y. Sanchez, Ionic conductivities of PPO-LiTFSI complexes	160
G. Petersen, A. Brodin, L.M. Torell and M. Smith, Light scattering and luminescence studies of $M(\text{CF}_3\text{SO}_3)_x$ -polyether complexes containing trivalent cations	165
D. Li, C.P. Hu and S.K. Ying, Structure and ionic conductivity of graft polymer network electrolytes containing some star-like side chains and LiClO ₄	172
I. Albinsson, B.-E. Mellander and J.R. Stevens, Ion conductivity, electrical relaxation and ion association in poly(propylene glycol) complexed with ammonium triflate	177

MIXED CONDUCTORS

H.J.M. Bouwmeester, H. Kruidhof and A.J. Burggraaf, Importance of the surface exchange kinetics as rate limiting step in oxygen permeation through mixed-conducting oxides	185
L. Hoffart, U. Heider, L. Jörissen, R.A. Huggins and W. Witschel, Transport properties of materials with the scheelite structure	195
K. Nisancioglu and T.M. Gür, Potentiostatic step technique to study ionic transport in mixed conductors	199
J. Oi, A. Kishimoto and T. Kudo, Hexagonal and pyrochlore-type cesium tungstates synthesized from cesium peroxo-polytungstate and their intercalation chemistry	204
Y. Shen, A. Joshi, M. Liu and K. Krist, Structure, microstructure and transport properties of mixed ionic-electronic conductors based on bismuth oxide Part I. Bi-Y-Cu-O system	209

Contents

K. Lade and T. Jacobsen, Determination of kinetic and transport parameters for oxygen in mixed conductors by an ac method	218
V.M. Orera, R.I. Merino and F. Peña, $\text{Ce}^{3+} \leftrightarrow \text{Ce}^{4+}$ conversion in ceria-doped zirconia single crystals induced by oxido-reduction treatments	224
SOLID OXIDE FUEL CELLS	
D.P. Fagg, S.M. Fray and J.T.S. Irvine, Reduced magnesium titanate electrodes for solid oxide fuel cells	235
F.P.F. van Berkel, F.H. van Heuveln and J.P.P. Huijsmans, Characterization of solid oxide fuel cell electrodes by impedance spectroscopy and $I-V$ characteristics	240
B. Gharbage, T. Pagnier and A. Hammou, Oxygen reduction at $(\text{La}_{0.5}\text{Sr}_{0.5})_y\text{MnO}_3$ thin films/YSZ interface	248
H. Sasaki, S. Otoshi, M. Suzuki, T. Sogi, A. Kajimura, N. Sugiura and M. Ippommatsu, Fabrication of high power density tubular type solid oxide fuel cells	253
Y. Takeda, Y. Sakaki, T. Ichikawa, N. Imanishi, O. Yamamoto, M. Mori, N. Mori and T. Abe, Stability of $\text{La}_{1-x}\text{A}_x\text{MnO}_{3-z}$ ($\text{A}=\text{Ca, Sr}$) as cathode materials for solid oxide fuel cells	257
I.R. Gibson, E.E. Lachowski, J.T.S. Irvine and G.P. Dransfield, Sintering of a plasma derived zirconia powder for solid oxide fuel cell electrolytes	265
Y. Mizutani, M. Tamura, M. Kawai and O. Yamamoto, Development of high-performance electrolyte in SOFC	271
INORGAMIC SOLID STATE IONICS	
S.-J. Kim, K.-H. Kim, S.-J. Oh, T.-K. Kang and I.-H. Kuk, Microstructural designs and electrical properties of Y_2O_3 -doped ZrO_2 s	279
N. Inoue, M. Tagami, Y. Nakamura, Y. Matsumoto, Y. Ogawa and T. Hasegawa, Electrical impedance and ultrasonic velocity of sodium ionic conductor $\text{Na}_{1+2x}\text{Zr}_{2-x}\text{Mg}_x(\text{PO}_4)_3$	285
P. Huang and E.A. Secco, Fast Na^+ ionic conductivity in glass and crystalline solids of $\text{Na}_2\text{MoO}_4\text{-UO}_2\text{SO}_4$ system	289
O. Mentre, F. Abraham, B. Deffontaines and P. Vast, Structural study and conductivity properties of $\text{Ca}_{1-x}\text{Na}_{2x}\text{Ti}_4(\text{PO}_4)_6$ solid solution	293
S. Ito, S. Nariki, K. Kozawa, T. Uchida and N. Yoneda, Crystal structure and mixed alkali effect of $(\text{K}^+, \text{Cs}^+)$ - β -ferrite	300
G. Fafilek and M.W. Breiter, Irreversible conductivity change of Ca β'' -alumina at high temperature	305
A.-Q. Pham, M. Puri, J.F. DiCarlo and A.J. Jacobson, Oxide ion conductivity of the new Aurivillius phase $(\text{Bi}_2\text{O}_2)(\text{NaNb}_2\text{O}_{6.5})$	309
R.K. Gupta and R.C. Agrawal, Investigation on transport properties of the silver ion conducting composite electrolyte	314

Contents

MEMBRANES AND (ELECTRO)-CHEMICAL REACTORS AND ELECTROCHEMICAL DEVICES

C.G. Vayenas, S. Bebelis, I.V. Yentekakis, Ch. Karavasilis and J. Yi, Non-Faradaic electrochemical modification of catalytic activity: solid electrolytes as active catalyst supports	321
R.T. Baker, I.S. Metcalfe, P.H. Middleton and B.C.H. Steele, Evaluation of perovskite anodes for the complete oxidation of dry methane in solid oxide fuel cells	328
N. Rao, T.P. Andersen and P. Ge, Tin mordenite membranes for direct methanol fuel cells	334
X.J. Huang and J. Schoonman, NO _x sensing characteristics of Bi ₂ Sr ₂ CaCu ₂ O _{8+x} and Bi ₂ Sr ₂ CuO _{6+x} films	338
G. Bonnet, M. Lachkar, J.P. Larpin and J.C. Colson, Organometallic chemical vapor deposition of rare earth oxide thin films. Application for steel protection against high temperature oxidation	344
Author index	349
Subject index	356